

## Abstract

### A high-efficiency LED-based illumination system with improved color rendering

The illumination system makes simultaneous use of the color-mixing principle from blue, green and red (RGB mixing) and the principle of converting of a primary radiation emitted by an LED into light with a longer wavelength by a phosphor which absorbs this radiation, with at least two LEDs being used, of which a first LED emits primarily in the range from 340 to 470 nm (dominant wavelength) and a second LED emits in the red region at 600 to 700 nm (dominant wavelength), wherein the green component is produced by the primary radiation of the first LED being at least partially converted by a green-emitting phosphor, the green-emitting phosphor used being a phosphor from the class of the oxynitridosilicates, having a cation M and the empirical formula  $M_{(1-c)}Si_2O_2N_2:D_c$ , M comprising Sr as a constituent and D being doped with divalent europium, where  $M = Sr$  or  $M = Sr_{(1-x-y)}Ba_yCa_x$  with  $x+y < 0.5$  is used, the oxynitridosilicate completely or predominantly comprising the high-temperature-stable modification HT.

Fig.